colored plates are used to show the author's interpretation of the transformation of the resting mycoplasm into the mycelium condition of the rust.—J. C. ARTHUR.

Light relations at high altitudes.—WIESNER's study of the *Lichtgenuss* of plants, already comprehensive for varying latitudes, has now been extended[21] to include high altitudes. During a period of thirty days from Aug. 16, photometric observations were made in the Yellowstone territory at eight altitudes ranging from 515 to 2210^{m} above sea level. The investigation shows that the behavior of plants with advancing latitude does not agree with that manifested under increasing altitude. The relative amount of available light appropriated by arctic plants increases inversely with the distance from the pole. This relation holds with increasing altitude only to a certain limit, above which a smaller and smaller share of available light is appropriated. The cypress habit of growth is evidently intended to protect from increased intensity of light, whether this accompanies low latitudes or high altitudes. This seems all the more probable because in such altitudes species having this habit do not show a defoliation from heat, which is manifested by other species that do not show it at lower levels.—RAYMOND H. POND.

Tomato rot.—VON OVEN[22] has recently described a disease of tomatoes caused by *Fusarium rubescens* Appel & Von Oven. This fungus causes a rotting of the tomato fruit, and evidently does not belong to the fungi in this group producing stem rot or wilt disease, although in cultures the pink and violet shades characteristic of the latter are also produced by this new species. As it is impossible to separate the species of Fusarium on morphological grounds, VON OVEN has attempted to distinguish this species at least from several disease-producing fusariums by their physiological characteristics. It is thus distinguished from *F. Solani*, *F. putrefaciens*, and *F. rhizogenum*. In cultures on sterilized potato small sclerotia were formed, which produced conidia after being exposed during December and January. The author concludes that this is a hibernating stage of the fungus, although he does not mention finding them in nature.—H. HASSELBRING.

Axillary scales of aquatic monocots.—As aquatic monocotyledons are by some held to be modern representatives of the more primitive angiosperms; as these forms may have been genetically related to some such type as Isoetes; and as he regards the ligule as an important phylogenetic organ, GIBSON[23] has made a study of the vestigial structures of the following families: Potamogetonaceae,

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21 WIESNER, J., Untersuchungen über den Lichtgenuss der Pflanzen im Yellowstonegebiete und in anderen Gegenden Nordamerikas. Sitzungsber. Kaiserl. Akad. Wiss. Wien, Math.-Naturw. Klasse **114**^{1}: (pp. 74.) *figs. 2.* 1905.

22 OVEN, E. VON, Ueber eine Fusariumerkrankung der Tomaten. Landw. Jahrb. **34**: 489–520. *pls. 5, 6. fig. 1.* 1905.

23 GIBSON, R. J. HARVEY, The axillary scales of aquatic monocotyledons. Jour. Linn. Soc. Bot. **37**: 228–237. *pls. 5, 6.* 1905.

Aponogetonaceae, Juncaginaceae, Alismaceae, Butomaceae, and Hydrocharidaceae. From an investigation of adult structure and manner of development, he has concluded that the axillary scales found at the bases of the leaves in the plants of these genera are homologous with the more specialized and solitary stipules of Selaginella and Isoetes. It will be recalled that GIBSON regards the ligule as a sort of specialized ramentum, protecting and keeping moist the young leaves and growing apex of Selaginella and Isoetes.—FLORENCE LYON.

Reserve food of trees.—NIKLEWSKI[24] confirms by macrochemical methods the observation of RUSSOW and of FISCHER, that in winter the fat-content of trees first increases and then diminishes. The process cannot be reversed by temperature changes. While a rise of temperature accelerates the formation of fat, no change affects its solution. The transformation of fat and of starch are not related. Low temperatures promote the formation of sugar from starch. Complex phenomena result from a rise of temperature. So great is the loss of reserves by the increased respiration, that it seems probable that bodies other than starch or fat share in the metabolism and give rise to carbohydrates.—C. R. B.

Conjugation of yeasts.—GUILLIERMOND[25] has extended his studies on the conjugation of yeasts to several additional forms of the Schizosaccharomyces and Zygosaccharomyces. The union of the cells is followed by the fusion of the two nuclei, after which the fusion nucleus divides and the two cells separate or spores are formed in the fusion cell. In some forms conjugation takes place with the germination of the spores. GUILLIERMOND regards this cell and nuclear fusion as a sexual act, but of course chiefly on physiological grounds. Since we do not know the history of the yeasts, it is a matter of speculation whether or not these conjugating cells are phylogenetically gametes.—B. M. DAVIS.

Amphispores in Uredineae.—ARTHUR has given an account of all species of rusts which have amphispores,[26] *i. e.*, as defined by CARLETON, one-celled spores which resemble the teleutospores of Uromyces in appearance, but have two or more germ-pores, and in germination behave like uredospores, their function seeming to be to tide the fungus over unfavorable conditions. This account includes one species of Uromyces and eight of Puccinia, one of which, *P. Garrettii*, is new. All the forms are American, for thus far no cases of the occurrence of amphispores have been reported from other parts of the world.—H. HASSELBRING.

Photosynthesis extra vitam.—BERNARD has again examined carefully the

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24 NIKLEWSKI, B., Untersuchungen über die Umwandlung einiger stickstoffreier Reservestoffe während der Winterperiode der Bäume. Beihefte Bot. Centralbl. **19**[1]: 68–117. 1905.

25 GUILLIERMOND, M. A., Recherches sur la germination des spores et la conjugaison chez les lévures. Rev. Gén. Bot. **17**:337–376. *pls. 6–9. figs. 11.* 1905.

26 ARTHUR, J. C., Amphispores of the grass and sedge rusts. Bull. Torr. Bot. Club **32**:35–42. *figs. 9.* 1905.